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This study analyzes interstate redistribution of Federal tax money under Title One of the Elementary and Secondary Education Act of 1965. First, the consistency of the criteria used to distribute funds is studied to see if people of similar financial positions are treated "qually. Results show that when compared with an alternative--the Orshansky index--the present official need index provides a satisfactory measure of the disadvantaged school population. The second part of the analysis looks at how people in different financial positions are treated. Consideration of both net transfers and gross aid leads to the conclusion that the degree of redistribution under the present program is very small. This suggests that the first major act of Federal aid to education is conservative when judged by distributional standards. If future Federal aid legislation is to make a marked contribution to the equalization of States' ability to provide education, fiscal capacity must be introduced as a criterion for distributing Federal funds. (TT)

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# THE ELEMENTARY AND SECONDARY EDUCATION ACT: A DISTRIBUTIONAL ANALYSIS

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The passage of the Elementary and Secondary Education Act (ESEA) of 1965 has been widely regarded as a turning point in intergovernmental relations. Together with amendments passed in 1966 and 1967, the ESEA of 1965 gave the Federal Government for the first time a comprehensive role in the financing of education. Constitutional and political obstacles which previously blocked acceptance of such a role have apparently been surmounted.

As a new program of federal grants-in-aid involving the distribution of large amounts of federal tax money, the ESEA has considerable interest for the student of intergovernmental relations. Like all such programs, it leads to spatial redistribution of funds among states and within states. The formula governing this redistribution deserves analysis simply because of the quantitative importance of the program. However, the formula may well have significance beyond the particular program in which it is now embodied. Given the widespread support which the ESEA has received, it seems likely that federal aid to education will expand further in the future. Because it is based on an acceptable political compromise, the ESEA's formula may be used as a model by politicians fashioning new federal grant programs to aid education in the years to come.

## Evaluating Federal Grant Programs

### 1. Functional versus Distributional Grants

Theoretically, grants have been treated in two different ways. One group of students sees grants as tools to improve allocation in a

federal state. In models of this kind, the need for grants arises because governmental functions cannot be mapped perfectly into the existing governmental set-up. Imperfect mapping leads to spill-outs and spill-ins among communities. Because benefits cannot be captured completely by the community providing the service, non-optimal allocation results. Functional grants designed to counteract the effects of spill-outs will lead to more efficient allocation.[1]

The functional approach may be contrasted with the distributional one. Students adopting this point of view look on grants as cost sharing plans or programs designed to redistribute public revenues among the member states of the federation. The analysis starts from the assumption that federal structure is important and that the federal government should deal with member states rather than individuals in the policy area where the grant applies. Unlike functional grants, programs with a distributional intent have the objective of diminishing inequality among the members of the union.[2]

Education is a service with important external benefits and a case for purely functional grants-in-aid to education could well be

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[1]See for example Albert Breton,"A Theory of Government Grants," The Canadian Journal of Economics and Political Science, 31. (May 1965) pp. 175-187.

[2]The distributional approach is best represented by Richard Musgrave's article "Approaches to Fiscal Theory of Political Federalism," Public Finances: Needs, Sources, and Utilization. National Bureau of Economic Research. Special Conference Series (Princeton, N. J.: Princeton University Press, 1961).

made.[3] However, a lack of knowledge about the exact nature of spillovers and a lack of statistical data preclude the construction of functional grant formulas. While we can identify education as an appropriate policy area, the theory of functional grants does not seem to provide any guide to the actual distribution of federal funds.

It is perhaps best to see existing programs of federal aid to education as a compromise between the two approaches. Congress chooses a particular service such as education because the existence of externalities provides a basis for federal intervention. Thus, the program is partially designed to increase the total amount of money devoted to education. At the same time, the program which is fashioned has distributional intent; it is conceived as a cost sharing plan which redistributes the burden of providing a given type of service. This interpretation seems certainly appropriate for the ESEA. In this case, Congress decided that the education of the disadvantaged was a problem of national importance. It then authorized intergovernmental grants in order to readjust the burden of financing programs of special education for children from poor families. The redistributive character of the grant is clear from the fact that federal aid to education is seen as an important means for helping to mitigate the fiscal problems of state and

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[3]See Burton A. Weisbrod, External Benefits of Public Education (Princeton, N. J.: Industrial Relations Section, Princeton University, 1964) and Werner Z. Hirsch et al., Spillover of Public Education Costs and Benefits (Los Angeles: Institute of Government and Public Affairs, University of California, 1964).

local governments while using the federal tax mechanism as a tool to channel resources from rich to poor states.

Federal funds distributed under the ESEA fall into two categories of unequal importance. Title One, which we analyse in this paper, authorizes much larger expenditures than any of the other provisions and money is allocated in accordance with a simple flat grant formula. Authorizations under Title One have been growing dramatically since the legislation was first enacted in 1965, with about one billion dollars available for distribution in each of the first three years. Other titles provide much smaller amounts of aid for such specialized objectives as the strengthening of state education departments, the expansion of school libraries and the support of educational research. We leave these more specialized and less important incentive payments aside to concentrate on the more basic and more general grants of Title One where the intent is redistributive.

## 2. Criteria for Analyzing Distributive Grants

The economist analyzing a given tax or tax system faces problems which are similar to those arising from redistributive grants. While he cannot in his role as economist make statements on the desirability of redistributing income among taxpayers, he may nevertheless appraise the tax system with regard to its ability to achieve stated or implied goals. Economists find it useful to distinguish between two different kinds of distributional considerations. A program is considered horizontally equitable when people who have the same resources and financial position

are treated in the same manner; this is commonly referred to as equal treatment of equals. The second consideration--vertical equity--refers to the way in which people in different positions are treated.

The economist can serve a useful purpose by examining various indices of equality and by checking whether equals, once defined, are in fact accorded equal treatment (horizontal equity). He may also point out the progressive or regressive impact of a given tax policy although he cannot make professional judgements about the desirable degree of vertical equity.

A similar approach may be taken in evaluating grants. It is most convenient, perhaps, to divide the analysis into two steps. Grants are paid out to the states according to a given set of criteria. Redistribution among states depends then in part on these criteria and an analysis of their horizontal consistency is indicated. It depends, in addition, on the way in which the federal government raises the funds to be given away in grants. As a second step, the analysis must proceed therefore to the discussion of the federal tax system. Only by considering both sides can we determine the program's net impact on the states.

## Criteria of Distribution

### 1. The Measurement of Need

A special purpose grant with distributional intent is a plan for sharing the burden of providing a given program or service smong the members of the federation. Federal payments must be in accordance with the number

of people served by the program and the unit cost of providing the service; that is, to use a term common in the literature, the payments must be in accordance with need. As a result, the formula governing the distribution of funds by the federal government should include a way of measuring both the number of people served by the program and an adjustment factor proportional to program cost.

As mentioned, the ESEA is intended to help school districts in upgrading the education of "educationally deprived" children. The special purpose of the program is clear from both the language of the 1965 Act and from the congressional hearings which preceded it. The meaning of the term "educationally deprived" is spelled out in a memorandum drawn up by the Office of Education at the request of the Senate Subcommittee on Education:

> An educationally deprived child is one whose educational performance in the school system is below the grade level appropriate for his age and below the potential of the child because of his general social and economic background. The educationally deprived child may perform at a rate which is normal for his economic and social group but he does not perform at a normal rate on a systemwide, statewide, or nationwide basis.[4]

In order to make this definition operational so that it can be used as a basis for the distribution of funds, a way of statistically identifying educationally deprived children must be found. In the legislation, this problem has been solved in the following manner: The number of children falling under the Act's definition is said to consist of

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[4]U. S. Senate, Committee on Labor and Public Welfare, Hearings on the Elementary and Secondary Education Act of 1965. (Washington: Government Printing Office, 1965), Vol. I, p. 565.

(1) the number of children aged 5-17, inclusive of families receiving an annual income below $2,000.

(2) the number of children of such ages from families receiving an annual income in excess of the low-income factor from payments under the program of aid to families with dependent children under a State Plan approved under Title IV of the Social Security Act.[5]

Title One uses the total of such children as the basic measure of need in the allocation of funds. However, distribution takes place according to the weighted number of qualified children, not simply in accordance with the size of the disadvantaged school population. The weights used in the basic formula consist of average expenditure per pupil in the recipeint state. As shall be seen, the introduction of weights affects distribution in a substantial fashion.

2. The Index of Need

How appropriate is the index of need, given the program's purpose? As pointed out, horizontal equity requires a measure of need which is proportional to program costs as they exist in the states. In dealing with this question we shall proceed in two steps, looking first at the way in which the number of children who qualify is determined and turning secondly to the weighting procedure which is part of the formula.

A. Measuring the Educationally Deprived School Population

The obstacles which must be surmounted if we attempt to arrive at an accurate statistical measure of the educationally deprived school

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[5]These provisions were amended in subsequent years to include other children within the care of state agencies and to adjust the low income figure to $3,000.

population are considerable. The memorandum which was quoted defines deprivation in terms of poor achievement. The educationally deprived child performs below the rate which is normal on a systemwide, statewide or nation-wide basis. This definition would seem to suggest the use of achievement scores as an index of identification. In practice, achievement scores are not available on a comprehensive basis, however, and a substitute measure must be devised.

Recent studies have shown that low family income and low achievement in school are highly correlated.[6] Low achievers are concentrated heavily in schools located in low-income areas, a finding which was much stressed in the hearings preceding the enactment of the 1965 legislation. In fact, it was widely assumed that underachievement is a direct result of poverty. While the linking of poverty and low achievement appears justified, several points should be noted.

(1) The studies link average achievement scores to average family income (median), the averages being either for school attendance areas or districts. The relation does not seem to have been investigated on a large scale for individual pupils.

(2) The studies have been done almost exclusively in urban areas. It is not known whether income is as important a factor in explaining low achievement for rural pupils as it is for urban pupils.

(3) It is not known how the degree of retardation is related to income.

Once we substitute the term "children from poverty families" for "educationally deprived children," we face a new problem of identification.

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[6]For a discussion of this relation and its implications for existing equalization grants, see Walter Hettich, "Equalization Grants, Minimum Standards, and Unit Cost Differences in Education," Yale Economic Essays, forthcoming.

What is a poverty family? In most governmental programs the answer to this question has been: a family which falls below a defined subsistence level of income. It should be clear that such a level must be measured in real terms since it represents an actual minimum budget for food and shelter. A simple dollar cut-off figure could hardly give us an index for identifying children suffering from educational deprivation. The cut-off line must be adjusted for factors such as family size and rural versus non-rural residence. An accurate definition is important for achieving horizontal equity. A poverty line which fails to distinguish between rural and non-rural residence, for example, will favor the rural over the more urbanized states because of the lower cost of living in rural areas.

The poverty line used in the ESEA is not designed as a real line, since it is a monetary income measure constant for all people and all states. The only exceptions made are for children from families receiving money under the Aid for Dependent Children section of the Social Security Act and children in other categories mentioned above. It is important, therefore, to ask how far the present index deviates from one which is based on a consistent and systematic definition of poverty. Table 1 provides an answer to this question. It shows both components of the actual index (number of children from families having less than $2000 of income in 1960 and number of children who qualify because they are enrolled under the AFDC program). The total of Title One children is then contrasted with the number of children classified as poor on the basis of an index

TABLE 1

Numbers of Children Eligible for Assistance Under ESEA
Alternative Definitions - FY 1966

Children from Families with Income Less Than $2000

| 50 States and D.C. | Low Income | AFDC | Total | % of Whole | Orshansky Poor Number | Orshansky Poor % |
|---|---|---|---|---|---|---|
| Alabama | 242522 | 0 | 242522 | 4.4 | 440967 | 4.0 |
| Alaska | 4796 | 919 | 5715 | 0.1 | 11174 | 0.1 |
| Arizona | 38851 | 5603 | 44454 | 0.8 | 97722 | 0.9 |
| Arkansas | 148158 | 0 | 148158 | 2.7 | 254827 | 2.3 |
| California | 206572 | 102097 | 308669 | 5.6 | 543819 | 5.0 |
| Colorado | 33581 | 7322 | 40903 | 0.7 | 88522 | 0.8 |
| Connecticut | 20731 | 7595 | 28326 | 0.5 | 56159 | 0.5 |
| Delaware | 7422 | 0 | 7422 | 0.1 | 19451 | 0.2 |
| Florida | 142533 | 0 | 142533 | 2.6 | 366639 | 3.3 |
| Georgia | 239789 | 0 | 239789 | 4.3 | 483898 | 4.4 |
| Hawaii | 8830 | 2413 | 11243 | 0.2 | 33668 | 0.3 |
| Idaho | 12250 | 2411 | 14661 | 0.3 | 34311 | 0.3 |
| Illinois | 147518 | 82499 | 230017 | 4.2 | 363247 | 3.3 |
| Indiana | 76386 | 3515 | 79901 | 1.4 | 208310 | 1.9 |
| Iowa | 71789 | 9265 | 81054 | 1.5 | 151858 | 1.4 |
| Kansas | 40263 | 5449 | 45712 | 0.8 | 101133 | 0.9 |
| Kentucky | 193559 | 0 | 193559 | 3.5 | 346487 | 3.2 |
| Louisiana | 201090 | 192 | 201282 | 3.6 | 410150 | 3.7 |
| Maine | 18408 | 2725 | 21133 | 0.4 | 62149 | 0.6 |
| Maryland | 53716 | 9420 | 63136 | 1.1 | 153457 | 1.4 |
| Massachusetts | 47065 | 16817 | 63882 | 1.2 | 145636 | 1.3 |
| Michigan | 124712 | 21029 | 145741 | 2.6 | 328255 | 3.0 |
| Minnesota | 77280 | 11602 | 88882 | 1.6 | 177391 | 1.6 |
| Mississippi | 254903 | 0 | 254903 | 4.6 | 386828 | 3.5 |
| Missouri | 125159 | 11297 | 136456 | 2.5 | 266527 | 2.4 |
| Montana | 14106 | 1484 | 15590 | 0.3 | 35879 | 0.3 |
| Nebraska | 34417 | 672 | 35089 | 0.6 | 79472 | 0.7 |
| Nevada | 3238 | 675 | 3913 | 0.1 | 8430 | 0.1 |

TABLE 1 (Continued)

| | Low Income | AFDC | Total | % of Whole | Number | % |
|---|---|---|---|---|---|---|
| New Hampshire | 5932 | 1052 | 6984 | 0.1 | 21404 | 0.2 |
| New Jersey | 59845 | 25496 | 85341 | 1.5 | 162666 | 1.5 |
| New Mexico | 37554 | 4315 | 41869 | 0.8 | 93809 | 0.9 |
| New York | 200060 | 99846 | 299906 | 5.4 | 560255 | 5.1 |
| North Carolina | 323096 | 3515 | 326611 | 5.9 | 598038 | 5.5 |
| North Dakota | 23346 | 1775 | 25121 | 0.5 | 52857 | 0.5 |
| Ohio | 151895 | 25472 | 177367 | 3.2 | 392856 | 3.6 |
| Oklahoma | 84779 | 11168 | 95947 | 1.7 | 178678 | 1.6 |
| Oregon | 23933 | 6295 | 30228 | 0.5 | 61509 | 0.6 |
| Pennsylvania | 175394 | 60258 | 235652 | 4.2 | 495346 | 4.5 |
| Rhode Island | 12083 | 4007 | 16090 | 0.3 | 33755 | 0.3 |
| South Carolina | 206638 | 0 | 206638 | 3.7 | 366098 | 3.3 |
| South Dakota | 30712 | 1528 | 32240 | 0.6 | 58127 | 0.5 |
| Tennessee | 220048 | 0 | 220048 | 4.0 | 410977 | 3.7 |
| Texas | 398224 | 0 | 398224 | 7.2 | 892676 | 8.1 |
| Utah | 11680 | 2109 | 13789 | 0.2 | 37352 | 0.3 |
| Vermont | 7208 | 580 | 7788 | 0.1 | 24639 | 0.2 |
| Virginia | 167874 | 3088 | 170962 | 3.1 | 357576 | 3.3 |
| Washington | 33072 | 9865 | 42937 | 0.8 | 90291 | 0.8 |
| West Virginia | 106406 | 82 | 106488 | 1.9 | 199943 | 1.8 |
| Wisconsin | 58446 | 10445 | 68891 | 1.2 | 159633 | 1.5 |
| Wyoming | 5408 | 661 | 6069 | 0.1 | 14199 | 0.1 |
| District of Columbia | 14854 | 5900 | 20754 | 0.4 | 45650 | 0.4 |

Source: Col. 1 & 2: U. S. Senate, Committee on Labor and Public Welfare, Subcommittee on Education, Maximum Grants - ESEA of 1965, (Washington: Government Printing Office, 1965)

Col. 5: U. S. Bureau of the Census, Special Tabulation

developed by Mollie Orshansky of the Social Security Administration using data from special runs made by the Bureau of the Census.[7] It is most interesting to note that the inclusion of AFDC children in the present legislation brings us close to a poverty index defined in real terms.[8] A comparison of columns 4 and 6 indicates that the proportion of poor children in each state under the present measure closely approximates the proportion which would result if the Orshansky poverty index were used. It is an intriguing question to the analyst whether this result is a coincidence or whether it shows actual legislative wisdom.

B. Index Weights

As pointed out, the distribution of federal funds takes place according to the weighted number of disadvantaged children in each state. Average per pupil expenditure in each state is used as the

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[7]Further information on our use of the Orshansky index and a more detailed comparison between the two measures of poverty may be found in David Barkin, "Poverty and Federal Aid to Education," Economic Development Administration Working Paper 4, Institute of Urban and Regional Studies, Washington University, St. Louis, Missouri, 1967 (processed).

[8]Ten of the states do not participate in the AFDC program and this helps to explain why the addition of eligible children under this program approximates the Orshansky measure. These states are concentrated in the southeastern part of the country and thus reduce the proportionate share of eligible children from these states; the straight money income measure tends to increase the relative number of eligible children in this region. The AFDC adjustment will become increasingly ineffective after 1968 because of a change in the Social Security legislation freezing the number of eligible children participating in the program after January 1, 1968.

weighting factor. In Table 2, we give expenditure per pupil by state both in absolute figures and as a percentage of the national average. Does the inclusion of these weights accord with horizontal equity?

We have defined need as the cost of providing a given service and pointed out that the index of need should be proportional to such cost. We may then ask whether the use of average expenditure is a way of taking into account variations in unit cost among states. If so, the weighting procedure would seem acceptable.

Some reflection on the determinants of per pupil expenditure will make it clear that factors other than cost variations are more important in accounting for differences in average per pupil expenditure. While it is probable that such cost variations do exist, their causes will be manifold and complex and it is unlikely that they can be taken into account in a federal formula without complicating it unduly. Furthermore, it is improbable that the range in the weighting factor from .5 to 1.5 can be fully explained by such differences in cost as may exist.

A second attempt to justify the use of average expenditure figures as weights in the present formula is based on the alleged relation between average expenditure per pupil and fiscal or tax effort for the support of education. It is common to include a variable for tax effort in intergovernmental programs. States or local communities making a large effort on their own, i.e. communities who spend a large share of available

Table 2

State Expenditures Per Pupil 1963-64
(1/2 Current Expenditures)

| 50 States and D.C. | 1/2 Current Expenditures | Percent of National Average |
|---|---|---|
| Alabama | 143 | 0.65 |
| Alaska | 337 | 1.53 |
| Arizona | 233 | 1.05 |
| Arkansas | 153 | 0.69 |
| California | 253 | 1.14 |
| Colorado | 239 | 1.08 |
| Connecticut | 254 | 1.15 |
| Delaware | 266 | 1.20 |
| Florida | 193 | 0.87 |
| Georgia | 156 | 0.70 |
| Hawaii | 211 | 0.96 |
| Idaho | 174 | 0.79 |
| Illinois | 266 | 1.20 |
| Indiana | 230 | 1.04 |
| Iowa | 230 | 1.04 |
| Kansas | 334 | 1.06 |
| Kentucky | 156 | 0.70 |
| Louisiana | 190 | 0.86 |
| Maine | 190 | 0.86 |
| Maryland | 241 | 1.09 |
| Massachusetts | 259 | 1.17 |
| Michigan | 238 | 1.08 |
| Minnesota | 276 | 1.25 |
| Mississippi | 121 | 0.55 |
| Missouri | 219 | 0.99 |
| Montana | 244 | 1.10 |
| Nebraska | 200 | 0.91 |
| Nevada | 243 | 1.10 |
| New Hampshire | 208 | 0.94 |
| New Jersey | 288 | 1.30 |
| New Mexico | 234 | 1.06 |
| New York | 366 | 1.65 |
| North Carolina | 162 | 0.73 |
| North Dakota | 208 | 0.94 |
| Ohio | 221 | 1.00 |
| Oklahoma | 181 | 0.82 |
| Oregon | 273 | 1.23 |
| Pennsylvania | 237 | 1.07 |
| Rhode Island | 251 | 1.13 |
| South Carolina | 133 | 0.60 |
| South Dakota | 216 | 0.98 |
| Tennessee | 146 | 0.66 |
| Texas | 197 | 0.89 |
| Utah | 209 | 0.94 |
| Vermont | 225 | 1.02 |
| Virginia | 179 | 0.81 |
| Washington | 251 | 1.14 |
| West Virginia | 160 | 0.72 |
| Wisconsin | 262 | 1.19 |
| Wyoming | 257 | 1.16 |
| District of Columbia | 259 | 1.17 |

Source: U.S. Senate, Committee on Labor and Public Welfare, Sub-committee on Education, Maximum Basic Grants-ESEA of 1965, (Washington: Government Printing Office, 1965).

resources on the service which the higher level of government considers important, are rewarded with a correspondingly higher federal or state share. Effort provisions are also intended to counteract the substitution effect, by including them, the higher level of government hopes to prevent lower governmental units from reducing their effort in response to the federal or state program. It should be clear that effort provisions are not meant to counteract existing inequalities in resources; rather, they are designed to relate the distribution of funds to the way in which states make use of their given capacity.

Is average expenditure per pupil a good proxy for effort? Students of public finance are in agreement that effort, whether by states or individual tax payers, should be related to some base. In other words, effort is a relative concept, it can best be expressed in percentage terms. A high absolute figure may merely indicate a high base. A state where the average per pupil expenditure is high in relation to the national average may spend a smaller percentage of taxable resources on education than one where average per pupil expenditure is low in absolute terms. If an effort provision is desired, horizontal equity would seem to demand the use of a relative rather than an absolute measure.

### 3. Fiscal Capacity as a Criterion for Distribution

Before turning to a quantitative analysis of redistribution under the ESEA, it may be useful to discuss a criterion of distribution not included in the Title One formula. The ESEA does not relate the distribution of federal funds to fiscal capacity in the recipient state. The

use of fiscal capacity is common in state grants to local governments and it has been advocated for federal programs by the prestigious Advisory Commission on Intergovernmental Relations. By relating federal payments to fiscal capacity, we can increase the net flow of funds from the wealthier to the poorer states.

Both horizontal and vertical distribution effects need be considered when evaluating the appropriateness of fiscal capacity as a criterion for grant programs. The question of whether to include such a measure is one of vertical equity. That is, the degree of redistribution from rich to poor states will be changed by this factor. The desirability of increased transfers of this sort is best evaluated through the political process. Once fiscal capacity is admitted as a criterion for distribution, then the question of horizontal equity arises. A consistent measure, one that does not differentiate among equals, must be used. The choice is not a simple one, it involves us in the question of how the taxable capacity of a state can best be measured, a question which has been debated at length in the literature on local finance. In our quantitative analysis of different distribution formulas, we use personal income by state while realizing that a case for other measures can be made as well.

## Redistribution Under the ESE Act

### 1. Net Transfer Among States

As pointed out, the actual redistributive effect of a federal program such as the ESEA depends both on the criteria which govern the

allocation of funds among states and on the tax system through which federal revenues are raised. In analyzing interstate redistribution, it is convenient to think of the money which Congress makes available in grants as a fund of given size. Payments into this fund are raised through the federal revenue system. To determine inflows, we look at federal collections in each state. As a second step, we then adjust collection data for interstate shifting.[9] In what follows, we have used a study by Labovitz in which he identifies the geographic origin of federal government revenues as the basis for our estimate of inpayments. Readers are referred to his study for a specification and discussion of the assumptions that underlie the figures.[10]

While payments into the fund depend on the federal revenue system as a whole, outpayments to the states are made according to the specific criteria of distribution established for the grant programs. Inpayments are thus given at the time of enactment, while distributional criteria remain to be fixed in the legislation.[11] In the policy making process,

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[9]This procedure may be considered objectionable because a particular program might be viewed as marginal and should, therefore, be financed by that source of revenue which would be reduced if the scale of government operations were to be reduced. This seems impractical in view of the lack of information about the way in which Congress would change the tax structure.

[10]I. M. Labovitz, "Federal Revenues and Expenditures in the Several States," Legislative Reference Service, Library of Congress, Washington, September 19, 1962 (processed). We assume that the geographic origin of federal revenues has not varied since this study.

[11]We assume that enactment of the grant program is not coupled with an increase in taxation.

Table 3

Net Distribution with Present Formula for ESEA
(Fiscal Year 1966)

| 50 States and D.C. | Tax Payments | Entitlements | Net Aid |
|---|---|---|---|
| | (Thousands of Dollars) | | |
| Alabama | 12,245 | 34,635 | 22,390 |
| Alaska | 1,030 | 1,927 | 896 |
| Arizona | 7,439 | 10,360 | 2,921 |
| Arkansas | 6,180 | 22,600 | 16,420 |
| California | 122,447 | 77,991 | -44,455 |
| Colorado | 10,987 | 9,774 | -1,213 |
| Connecticut | 23,003 | 7,197 | -15,806 |
| Delaware | 5,493 | 1,975 | -3,518 |
| Florida | 30,555 | 27,479 | -3,076 |
| Georgia | 16,365 | 37,342 | 20,977 |
| Hawaii | 3,548 | 2,375 | -1,174 |
| Idaho | 3,432 | 2,546 | -886 |
| Illinois | 77,702 | 61,113 | -16,589 |
| Indiana | 27,008 | 18,378 | -8,630 |
| Iowa | 14,647 | 18,653 | 4,006 |
| Kansas | 11,559 | 10,717 | -841 |
| Kentucky | 12,474 | 30,131 | 17,657 |
| Louisiana | 14,991 | 38,344 | 23,353 |
| Maine | 4,921 | 4,014 | -907 |
| Maryland | 21,171 | 15,249 | -5,922 |
| Massachusetts | 37,993 | 16,540 | -21,454 |
| Michigan | 51,495 | 34,736 | -16,760 |
| Minnesota | 19,569 | 24,509 | 4,940 |
| Mississippi | 6,065 | 30,894 | 24,830 |
| Missouri | 27,121 | 29,858 | 2,737 |
| Montana | 4,005 | 3,801 | -204 |
| Nebraska | 7,896 | 7,033 | -863 |
| Nevada | 2,402 | 952 | -1,450 |
| New Hampshire | 3,891 | 1,452 | -2,438 |
| New Jersey | 47,378 | 24,560 | -22,818 |
| New Mexico | 4,577 | 9,805 | 5,228 |
| New York | 149,111 | 109,658 | -39,453 |
| North Carolina | 17,966 | 52,826 | 34,860 |
| North Dakota | 2,746 | 5,220 | 2,474 |
| Ohio | 64,084 | 39,186 | -24,899 |
| Oklahoma | 11,215 | 17,394 | 6,179 |
| Oregon | 11,100 | 8,246 | -2,854 |
| Pennsylvania | 76,330 | 55,941 | -20,389 |
| Rhode Island | 5,607 | 4,040 | -1,568 |
| South Carolina | 8,012 | 27,479 | 19,467 |
| South Dakota | 2,862 | 6,953 | 4,092 |
| Tennessee | 14,647 | 32,206 | 17,559 |
| Texas | 51,725 | 78,323 | 26,598 |
| Utah | 4,577 | 2,877 | -1,701 |
| Vermont | 2,061 | 1,750 | - 311 |
| Virginia | 19,913 | 30,619 | 10,706 |
| Washington | 18,310 | 10,774 | -7,535 |
| West Virginia | 8,124 | 16,991 | 8,867 |
| Wisconsin | 24,260 | 18,060 | -6,200 |
| Wyoming | 2,061 | 1,563 | - 498 |
| District of Columbia | 8,125 | 5,382 | -2,743 |

Source:

Column 1: Proportion of tax revenue from each state based on I.M.Labovitz, "Federal Revenues & Expenditures in the Several States," Leg. Ref. Ser., Lib. of Congress, Washington, Sept. 1962.

Column 2: Computed from number of eligible children and one-half current expenditures on education.

net redistribution is established therefore when program criteria are determined. The student of grant programs who wants to analyze interstate redistribution must focus on such criteria. As indicated, it is a major purpose of this article to spell out the implications of the ESEA and to contrast existing arrangements with possible alternatives. In this section we do this by contrasting net redistribution under Title One with patterns of vertical equity which would result if other criteria of distribution were specified. While only a political decision can determine the superiority of one pattern over another, we think it useful to present the menu of choices as clearly as possible.

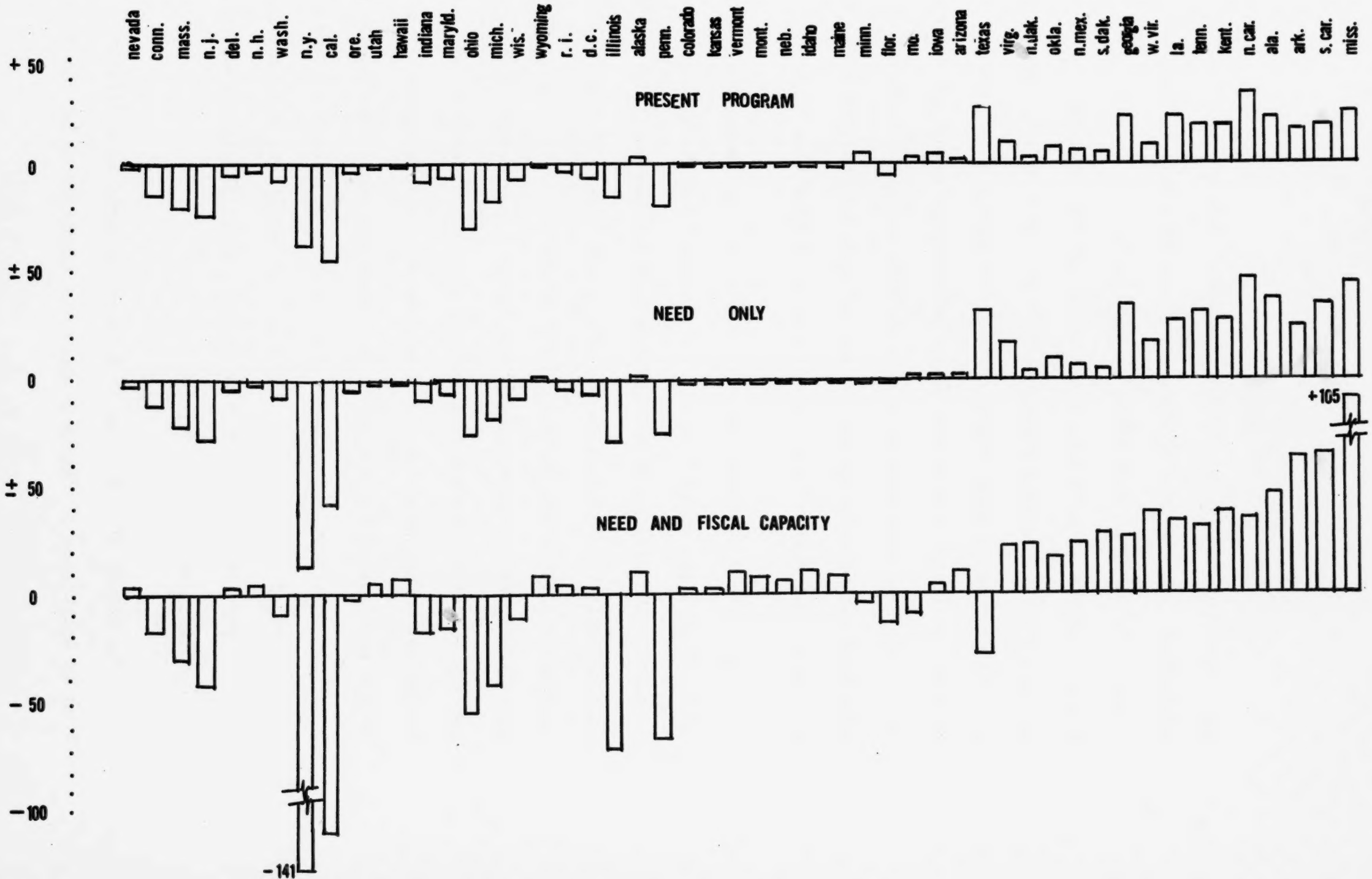
In Table 3 we summarize the actual situation under Title One, giving both state contributions to the total fund and federal outpayments. The figures of outpayments used in this analysis are the states' entitlements based on the assumption that each unit will seek to spend all the money it is eligible to receive under the program. There may be differences between entitlements and actual disbursements for any number of reasons ranging from specific circumstances in an individual school district which inhibit the administrators from making application for the funds to inadequate facilities and/or personnel to undertake a program of compensatory education. Since we are interested in contrasting the implications of the existing formula with the results of alternative formulas, entitlements rather than disbursements are the appropriate variable.

The nature of redistribution can be grasped more clearly from an inspection of Figure 1 where net transfers under the 1965

figure 1

## NET TRANSFERS AMONG STATES WITH ALTERNATIVE CRITERIA OF DISTRIBUTION

( MILLIONS OF DOLLARS )



formula have been depicted graphically. In interpreting the figure, it is important to note that states have been ranked according to fiscal capacity per unit of need. Nevada, having the highest income per eligible child, is placed at the far left while Mississippi, the state with the lowest ratio, is found on the far right. The reason for the ordering is analytical: If we look on the ESEA as a federal cost sharing plan, designed for a special purpose, i.e. the financing of programs for the disadvantaged, we must be interested in the outflow of funds from states with high income per unit of need to states with low income per unit of need.[12] Figure 1 shows that, on the whole, there is a flow in this direction. New York, California and Ohio are the largest net contributors while the Southern States, all placed at the low end, are net gainers. It is interesting to note that a large group of states break nearly even, getting back in grants an amount roughly equal to that which the Federal Government raises from their tax payers for the ESEA fund.[13]

We turn now to a contrast of the actual formula with one which uses only the measure of need - the number of children - and distributes

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[12]It should be recalled in this connection that need is measured by eligible children, not by the population at large. A ranking according to per capita income would not be suitable, therefore.

[13]The analysis in this paper deals only with interstate changes induced by the federal expenditure and taxation process. We recognize the importance of but do not enter into the difference which emerges because rich people in poor states are, on the whole, net taxpayers while their poor neighbors are net recipients of tax funds. This interstate redistribution of income is beyond our scope.

the appropriation according to the share of children in a particular state eligible for assistance. Unlike the existing formula, this one does <u>not</u> include weights. Symbolically, it may be written:

$$(1) \quad A_i = \frac{N_i}{\sum_i N_i} \cdot F$$

Where $A_i$ is the amount of aid received by state i; $N_i$ is the number of eligible children in that state, and F is the total appropriation under the program. The results, given in gross terms in Column 1, Table 4 and represented in net terms in Column 2 and graphically in the second part of Figure 1, reveal an interesting contrast. Elimination of the weighting procedure clearly accentuates the pattern of net transfers. New York and California stand to lose much while several of the southern states register gains. More generally net flows increase and the degree of redistribution is considerably higher. A comparison of patterns thus suggests that the weighting procedure can be best understood as a political compromise which the fiscally stronger states (those which also have high average expenditure per pupil) were able to impose on the weaker ones.

To complete the analysis of alternatives, we introduce two formulas which incorporate fiscal capacity as a criterion of distribution. Taking income as the measure of fiscal capacity, we first assume that the fund is allocated among states in proportion to the ratio of need to capacity. In this case:

$$(2) \quad A_i = \frac{N_i / Y_i}{\sum \left( N_i / Y_i \right)} \cdot F$$

Table 4

Alternative Distribution Formulae, ESEA
Gross and Net Payments
(Thousands of Dollars)

| 50 States and D.C. | Formula 1 | | Formula 2 | | Formula 3 | |
|---|---|---|---|---|---|---|
| | Gross | Net | Gross | Net | Gross | Net |
| Alabama | 50096 | 37851 | 60512 | 48267 | 66990 | 54745 |
| Alaska | 1180 | 150 | 11306 | 10275 | 9740 | 8709 |
| Arizona | 9183 | 1744 | 18645 | 11206 | 14654 | 7215 |
| Arkansas | 30604 | 24424 | 68981 | 62800 | 63162 | 56982 |
| California | 63760 | -58687 | 8143 | -114304 | 6863 | -115584 |
| Colorado | 8449 | -2538 | 12091 | 1104 | 10340 | -647 |
| Connecticut | 5851 | -17151 | 4646 | -18356 | 5640 | -17363 |
| Delaware | 1533 | -3960 | 6634 | 1141 | 7769 | 2276 |
| Florida | 29442 | -1112 | 16517 | -14038 | 17299 | -13256 |
| Georgia | 49532 | 33167 | 42951 | 26586 | 45187 | 28822 |
| Hawaii | 2322 | -1226 | 9276 | 5728 | 10890 | 7342 |
| Idaho | 3028 | -404 | 14701 | 11269 | 15679 | 12247 |
| Illinois | 47513 | -30189 | 10608 | -67095 | 13326 | -64377 |
| Indiana | 16505 | -10503 | 9509 | -17499 | 9195 | -17812 |
| Iowa | 16743 | 2096 | 17729 | 3082 | 16362 | 1715 |
| Kansas | 9442 | -2116 | 12731 | 1173 | 10596 | -963 |
| Kentucky | 39982 | 27508 | 48348 | 35874 | 59770 | 47296 |
| Louisiana | 41578 | 26587 | 46059 | 31068 | 38061 | 23070 |
| Maine | 4365 | -556 | 14819 | 9898 | 15555 | 10634 |
| Maryland | 13042 | -8130 | 9556 | -11615 | 10099 | -11072 |
| Massachusetts | 13196 | -24798 | 5941 | -32053 | 8493 | -29500 |
| Michigan | 30105 | -21391 | 9821 | -41674 | 9210 | -42286 |
| Minnesota | 18360 | -1209 | 15058 | -4511 | 12422 | -7148 |
| Mississippi | 52654 | 46589 | 111615 | 105550 | 103214 | 97149 |
| Missouri | 28187 | 1066 | 17386 | -9735 | 21724 | -5397 |
| Montana | 3220 | -785 | 13618 | 9613 | 11274 | 7268 |
| Nebraska | 7248 | -648 | 14493 | 6597 | 15856 | 7960 |
| Nevada | 808 | -1594 | 4360 | 1958 | 4536 | 2134 |

Table 4 (Continued)

| 50 States and D.C. | Formula 1 | | Formula 2 | | Formula 3 | |
|---|---|---|---|---|---|---|
| | Gross | Net | Gross | Net | Gross | Net |
| New Hampshire | 1443 | -2448 | 6688 | 2797 | 7529 | 3638 |
| New Jersey | 17628 | -29750 | 6291 | -41087 | 7082 | -40296 |
| New Mexico | 8649 | 4071 | 30139 | 25562 | 21380 | 16803 |
| New York | 61950 | -87161 | 7807 | -141304 | 7758 | -141352 |
| North Carolina | 67466 | 49500 | 52334 | 34368 | 51785 | 33819 |
| North Dakota | 5189 | 2443 | 26991 | 24245 | 22584 | 19839 |
| Ohio | 36638 | -27447 | 9708 | -54376 | 10100 | -53984 |
| Oklahoma | 19819 | 8604 | 27311 | 16096 | 27792 | 16577 |
| Oregon | 6244 | -4856 | 9103 | -1998 | 7699 | -3401 |
| Pennsylvania | 48677 | -27653 | 11670 | -64661 | 14465 | -61865 |
| Rhode Island | 3324 | -2284 | 10485 | 4878 | 12036 | 6429 |
| South Carolina | 42684 | 34672 | 72652 | 64640 | 74582 | 66571 |
| South Dakota | 6660 | 3798 | 31307 | 28446 | 27376 | 24514 |
| Tennessee | 45454 | 30807 | 46385 | 31738 | 51107 | 36460 |
| Texas | 82259 | 30534 | 26076 | -25649 | 25266 | -26459 |
| Utah | 2848 | -1729 | 9110 | 4533 | 6729 | 2152 |
| Vermont | 1609 | -452 | 13198 | 11137 | 14507 | 12446 |
| Virginia | 35315 | 15402 | 26420 | 6507 | 29179 | 9266 |
| Washington | 8869 | -9440 | 7772 | -10537 | 6469 | -11841 |
| West Virginia | 21997 | 13873 | 44233 | 36109 | 47175 | 39051 |
| Wisconsin | 14230 | -10029 | 9854 | -14405 | 9730 | -14529 |
| Wyoming | 1254 | -807 | 10259 | 8199 | 7864 | 5804 |
| District of Columbia | 4287 | -3838 | 10582 | 2457 | 18334 | 10209 |

where $Y_i$ is the income of state i.[14] A checking of the figures in Columns three and four of Table 4, where results for the new formula are given, against those in the previous table confirm the expectation that the introduction of fiscal ability has strong implications for redistribution. The graphic representation of the new pattern in the bottom part of Figure 1 makes this even more apparent. Net contributions are much larger and net drawings have increased correspondingly. Among losers, New York and California are again affected most dramatically - New York's net loss jumps to $144 million - but other industrial states such as Illinois, Pennsylvania and Ohio also feel a strong impact. Among gainers, Mississippi's share more than doubles - a striking improvement in the position of the poorest state. It is interesting to note that some states have the sign of their net transfer changed under the new formulation. The most significant change occurs for Texas where a switch from a $26.6 million receipt to a withdrawal of $25.6 million occurs. This happens because Texas has the largest number of children eligible for assistance but is much lower down on the list of needy states when fiscal capacity is taken into account - it places 16th from the top when states are ranked according to the ratio of need to fiscal capacity.

The last alternative examined introduces a weighting factor to take account of individual states' willingness to tax themselves for

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[14]Personal income figures for 1963 are from U.S., Bureau of the Census, Statistical Abstract of the United States, 1965, (Washington; Government Printing Office, 1965). Table 458, p. 334.

education (tax effort). Although there are a number of different ways of introducing this consideration, we have selected one that relates the tax effort of a state to the average effort of all state governments. The new formula is:

$$(3) \quad A_i = \frac{N_i}{\frac{Y_i\left(\bar{t} / t_i\right)}{\sum \frac{N_i}{Y_i\left(\bar{t} / t_i\right)}}}$$

where $t_i$ is the tax rate of state i for educational expenditure and $\bar{t}$ is the average tax rate for all states combined.[15] The results for the new formula are given in Column 5 of Table 4; they differ very little from those obtained from the preceding formula. A slight effect can be expected if $t_i$ is distributed very closely around $\bar{t}$. In this case, an effort provision seems unnecessary since there is little difference in relative tax effort among states and not much to be rewarded. The slight modification which the addition of tax effort produces in Formula (2) suggests that it may not be wise to complicate our consideration of changes in vertical equity by discussing it further.

2. Gross Aid

While from a theoretical point of view, it is best to measure the redistributive impact of a grant program by analyzing net transfers among states, the policy maker may be more interested in the patterns of gross aid created by alternative formulas. State officials, for example, will

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[15]The tax rate, $t_i$, is computed by dividing the state's expenditures for education by the state's personal income.

not be concerned with federal taxes raised in their states; they will be interested only in grant payments when comparing the position of their state to that of others. Members of Congress, similarly, may focus on gross aid when evaluating the advantages which a given program offers to their state or district.[16]

Tables 3 and 4 include the statistical material necessary for a separate evaluation of the gross aid pattern. Outpayments are presented along with net aid for both the actual formula and the proposed alternatives. Because the pattern of gross aid is important in policy making, it will be useful to add a brief discussion of gross distribution under the ESEA.

As pointed out, the ESEA has as its purpose to provide federal funds for the education of the disadvantaged. In evaluating gross distribution, we therefore compare the proportion of eligible children in a given state with the proportion of aid which this state receives from the Federal Government. Figure 2 is based on such an analysis. On the vertical axis we measure gross aid to each state as a percentage of all aid and on the horizontal axis we plot percentage figures of eligible children. States are again ranked from low to high according to the ratio of income to need.

Using the modified type of Lorenz curves shown in Figure 2, we can summarize the implications of gross aid patterns. We find that, on

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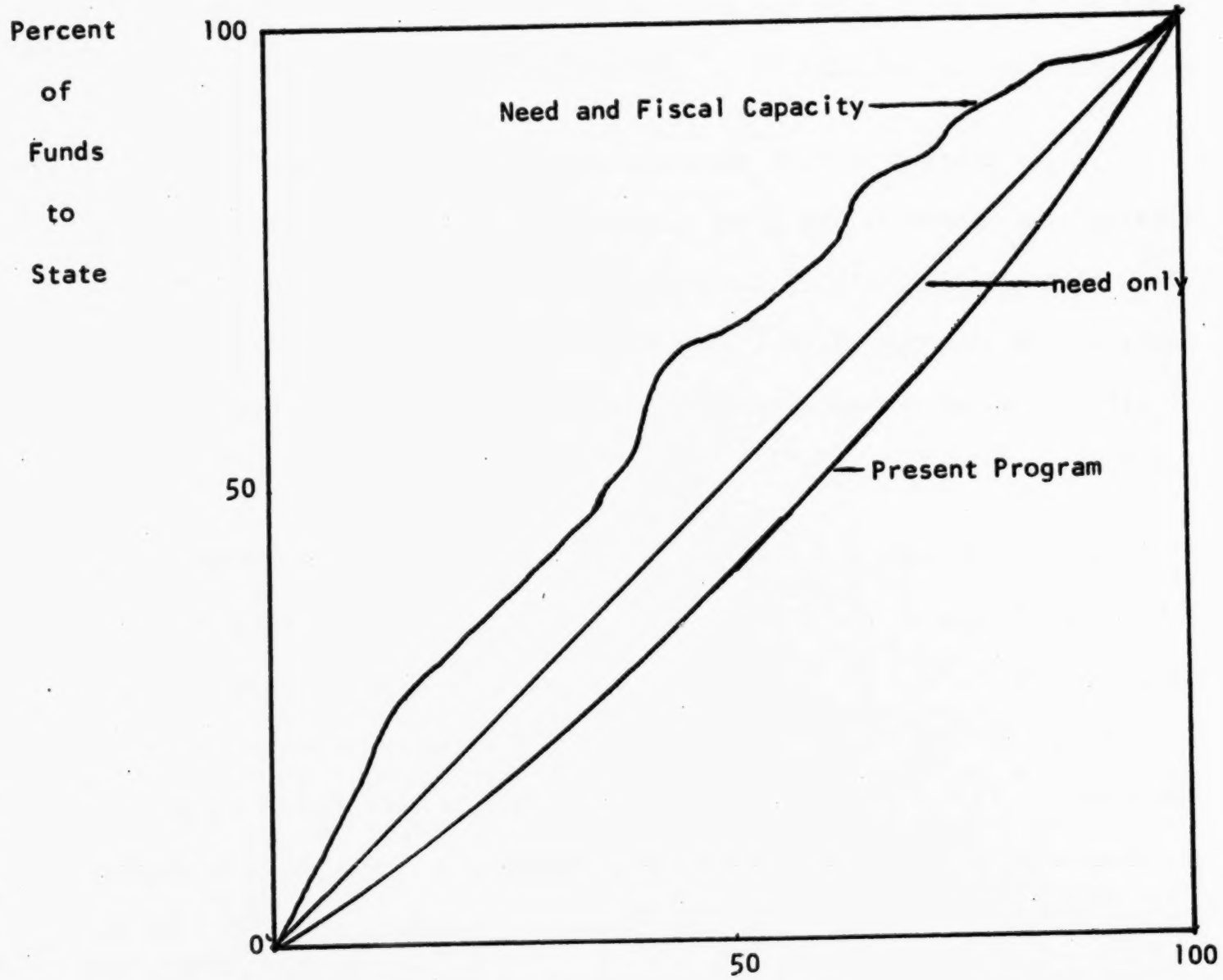
[16]This would seem likely if no rise in taxes accompanies the enactment of the grant program. Given the operation of the progressive income tax, leading to a steadily increasing federal share of GNP, further programs will likely be financed from general revenue sources.

Figure 2

Distribution of Gross Aid Among States




Source: See text.

balance, the distributional impact of the present program is regressive; that is, when measured against the numbers of children eligible for assistance, proportionately more money goes to the richer states than to the poorer ones.[17] In contrast to the curve below the 45° line of equality which represents the actual situation, the curve above the diagonal depicts the distributional impact of gross aid if the alternative formula employing an index of both fiscal capacity and need is used. In this case the children from low income families living in the poorest states receive a proportionally greater share of the total appropriation. Our first alternative, based solely on the numbers of eligible children, coincides exactly with the diagonal since it is based on the premise that assistance would be available in direct proportion to the relative numbers of eligible children in each state. It may be called the "neutral" case when contrasted with the actual formula which has a regressive impact.

## Conclusion

In this article we have analysed interstate redistribution under Title One of the Elementary and Secondary Education Act. First, we discussed the horizontal consistency of criteria of distribution. It was found that the present need index provides a satisfactory measure of the disadvantaged school population. An alternative way of measuring the number of children from poverty families - the Orshansky index - yields

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[17]The curves look very similar for an analysis which ranks states by per capita income rather than by the ratio of Y/N. Figure 2 can therefore be interpreted as well in terms of this more common ranking.

results which are closely similar to those based on the official index. It must be noted, however, that recent changes in the Aid to Dependent Children legislation may impair the future usefulness of the official measure.

The second part of our analysis - the part which relates to vertical equity - has implications of a stronger nature. Consideration of both net transfers and gross aid leads us to the conclusion that the degree of redistribution under the present program is very small. It is also clear that the weighting procedure now in use serves to further limit the redistributive impact of a program which might otherwise be considered as merely neutral. Thus the first major act of federal aid to education is a conservative measure when judged by distributional standards. While the fact that such an act was passed by Congress may constitute a new departure, the program itself breaks little new ground in equalizing the states' ability to provide education. If future federal aid legislation is to make a marked contribution to this consideration should be given to introducing fiscal capacity as a criterion for distributing federal funds.